

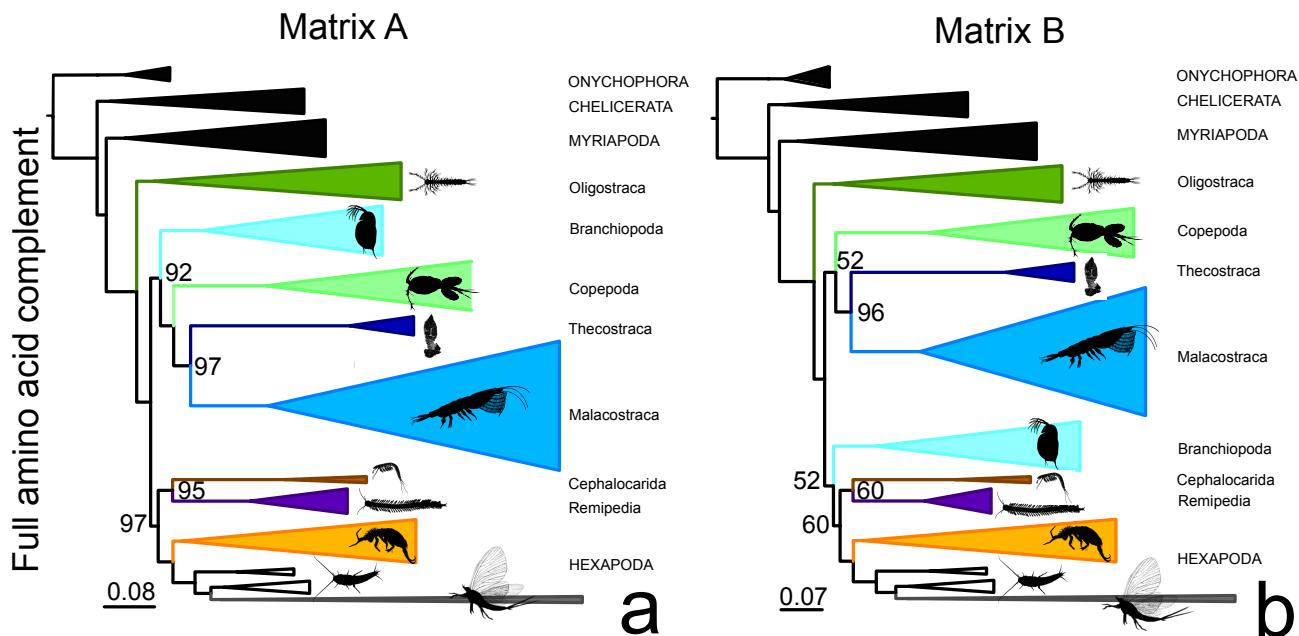
## **Supplementary Information**

### **Pancrustacean evolution illuminated by taxon-rich genomic-scale data sets with an expanded remipede sampling**

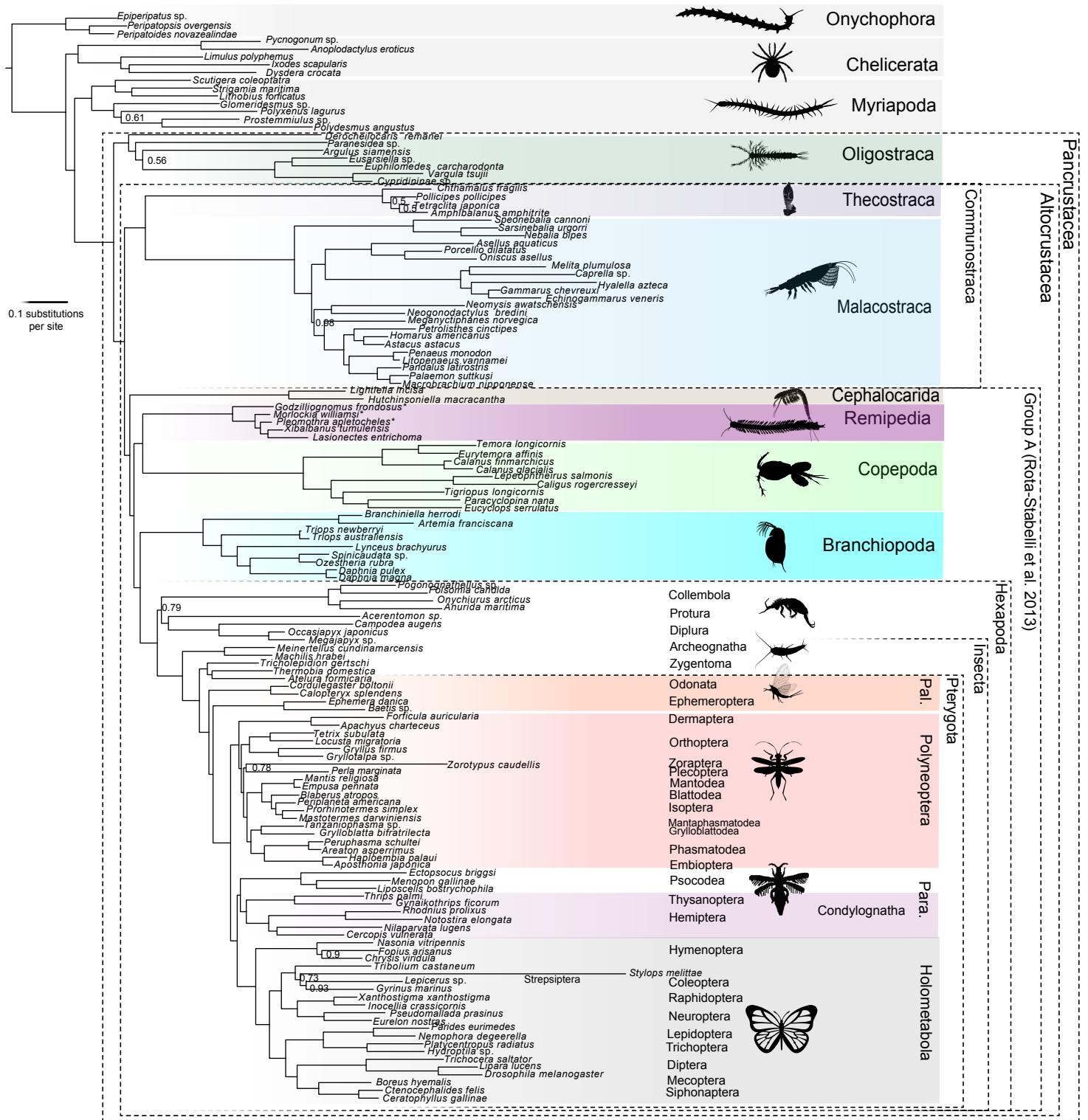
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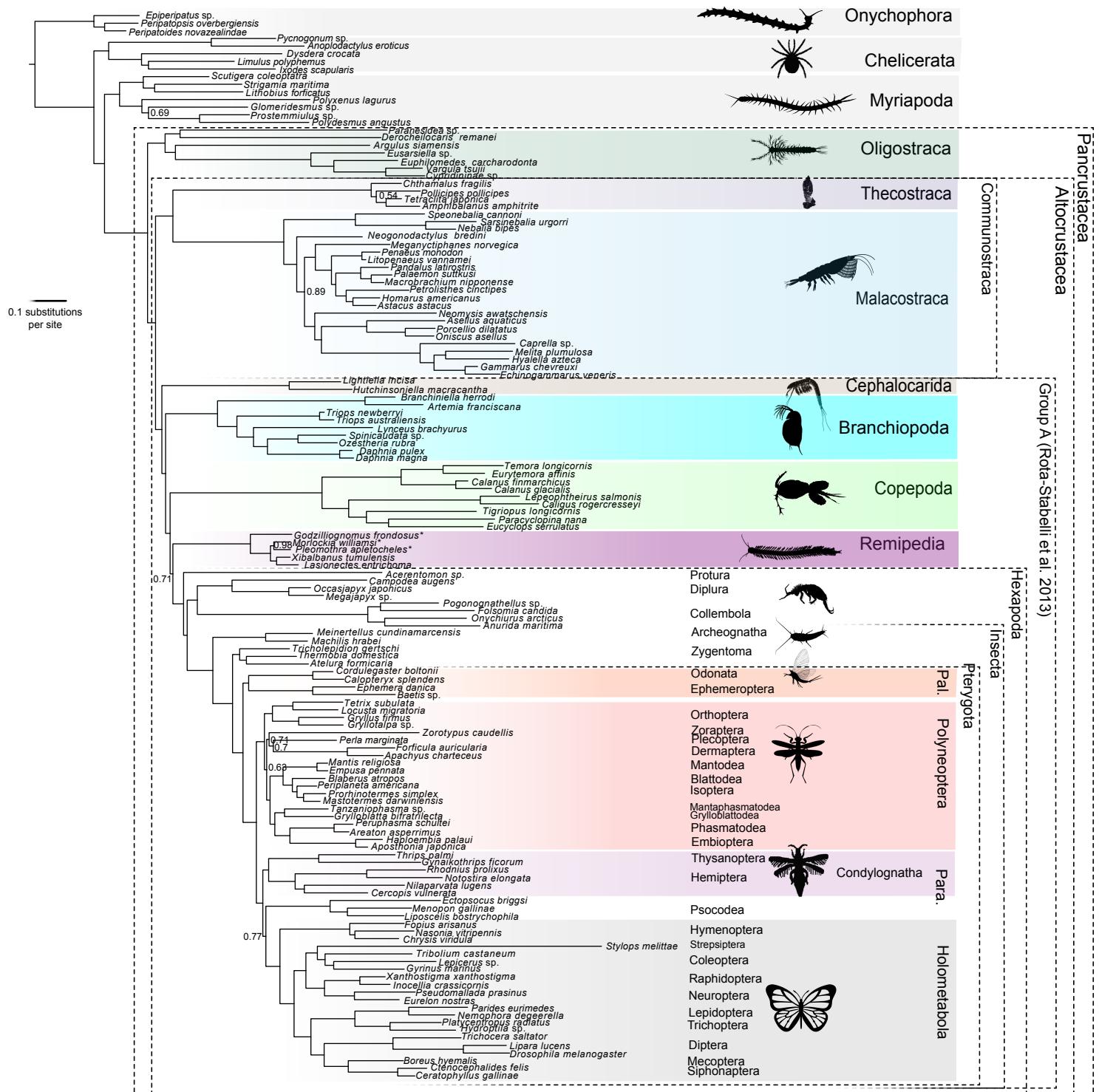
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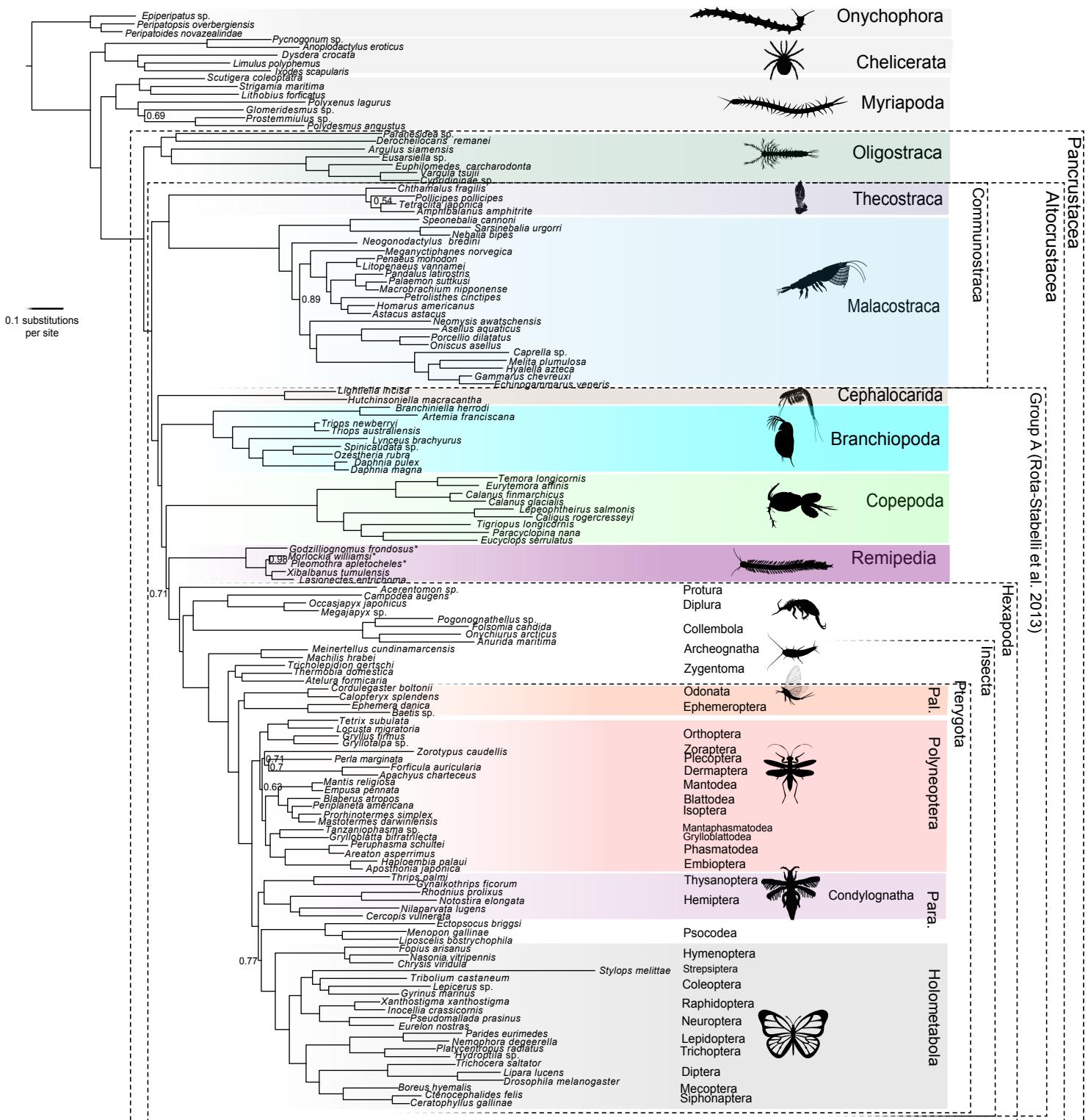
**Figure S1.** Schematic representations of the relationships inferred using ML under the LG+I+G4 model (**A**) on Matrix A (**B**) and on Matrix B. Support values represent bootstrap support and only those below 100 are shown.

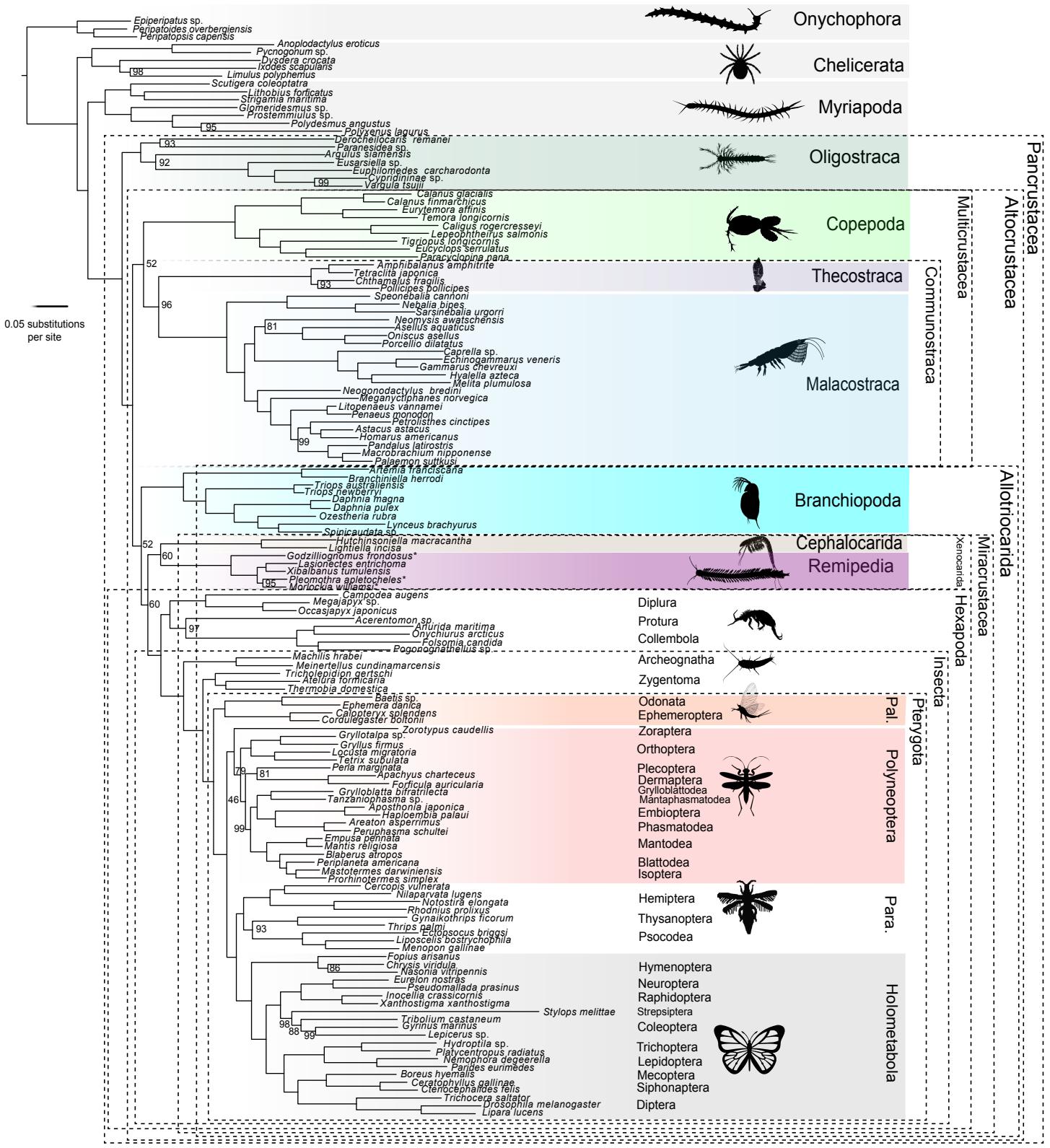


a



4





**Supplementary Figure 2.** Detailed phylogenetic trees: Bayesian analyses of (A) CAT-GTR+G analysis of Matrix A (B) and CAT-GTR+G analysis of Matrix B, and ML analyses of (C) Matrix A analysed under the LG+I+G4 model (D) and Matrix B analysed under the LG+I+G4 model. Support values represent posterior probabilities (A-B) or bootstrap support (C-D) and only those below 1 or below 100, Bayesian and ML respectively, are shown. Newly sequenced remipede transcriptomes marked with an asterisk.

**Table S1.** Species names and accession numbers from the species used in this study.

Class/Clade	Species	Accession
Crustacea: Branchiopoda	<i>Artemia franciscana-GA17E</i>	SRR1324814
Crustacea: Branchiopoda	<i>Branchinella herrodi</i>	SRR4113492
Crustacea: Branchiopoda	<i>Daphnia magna</i>	GDIP00000000.1
Crustacea: Branchiopoda	<i>Daphnia pulex</i>	PRJNA12756
Crustacea: Branchiopoda	<i>Lynceus brachyurus</i>	67305[BioProject]
Crustacea: Branchiopoda	<i>Ozestheria rubra</i>	SRR4113504
Crustacea: Branchiopoda	<i>Spinicaudata sp. BMR-2011</i>	67311[BioProject]
Crustacea: Branchiopoda	<i>Triops australiensis</i>	SRR4113493
Crustacea: Branchiopoda	<i>Triops newberryi</i>	GEHY00000000.1
Crustacea: Cephalocarida	<i>Hutchinsoniella macracantha</i>	SRR4113505
Crustacea: Cephalocarida	<i>Lightiella incisa</i>	SRR4113506
Crustacea: Copepoda	<i>Calanus finmarchicus</i>	SRR4113507
Crustacea: Copepoda	<i>Calanus glacialis</i>	HACJ00000000
Crustacea: Copepoda	<i>Caligus rogercresseyi</i>	GAZX00000000
Crustacea: Copepoda	<i>Eucyclops serrulatus</i>	GARW00000000.1
Crustacea: Copepoda	<i>Eurytemora affinis</i>	GEAN00000000.1
Crustacea: Copepoda	<i>Lepeophtheirus salmonis</i>	HACA00000000
Crustacea: Copepoda	<i>Paracyclops nana</i>	GCJT00000000
Crustacea: Copepoda	<i>Temora longicornis</i>	SRR4113508
Crustacea: Copepoda	<i>Tigriopus japonicus</i>	GCHA00000000.1
Crustacea: Malacostraca:Peracarida:Isopoda	<i>Asellus aquaticus</i>	GDKY00000000.1
Crustacea: Malacostraca:Eucarida:Decapoda:Pleocyemata	<i>Astacus astacus</i>	GEDF01000000.1
Crustacea: Malacostraca:Peracarida:Amphipoda	<i>Caprella sp.</i>	SRR4113494
Crustacea: Malacostraca:Peracarida:Amphipoda	<i>Echinogammarus veneris</i>	GARO00000000.1
Crustacea: Malacostraca:Peracarida:Amphipoda	<i>Gammarus chevreuxi</i>	GFCV00000000.1
Crustacea: Malacostraca:Eucarida:Decapoda	<i>Homarus americanus</i>	GEBG00000000
Crustacea: Malacostraca:Peracarida:Amphipoda	<i>Hyalella azteca</i>	GEHV00000000.1
Crustacea: Malacostraca:Eucarida:Decapoda:Dendrobranchiata	<i>Litopenaeus vannamei</i>	GETZ00000000
Crustacea: Malacostraca:Eucarida:Decapoda:Pleocyemata	<i>Macrobrachium nipponense</i>	GCVG00000000.1
Crustacea: Malacostraca:Eucarida:Euphausiacea	<i>Meganyctiphanes norvegica</i>	GETT00000000.1
Crustacea: Malacostraca:Peracarida:Amphipoda	<i>Melita plumulosa</i>	GAKD00000000.1
Crustacea: Malacostraca:Peracarida:Isopoda	<i>Oniscus asellus</i>	SRR3263253
Crustacea: Malacostraca:Phyllocarida:Leptostraca	<i>Nebalia bipes</i>	PRJNA67309
Crustacea: Malacostraca:Eumalacostraca:Hoplocarida:Stomatopoda	<i>Neogonodactylus bredini</i>	SRR4113511
Crustacea: Malacostraca:Peracarida:Mysidacea	<i>Neomysis awatschensis</i>	GDFV00000000.1
Crustacea: Malacostraca:Eucarida:Decapoda:Pleocyemata	<i>Palaemon suttkusi</i>	SRR4113510
Crustacea: Malacostraca:Eumalacostraca:Decapoda:Pleocyemata	<i>Pandalus latirostris</i>	DRR001118
Crustacea: Malacostraca:Eucarida:Decapoda:Dendrobranchiata	<i>Penaeus monodon</i>	GFCA00000000
Crustacea: Malacostraca:Eucarida:Decapoda:Pleocyemata	<i>Petrolisthes cinctipes</i>	EST NCBI
Crustacea: Malacostraca:Eumalacostraca:Peracarida:Isopoda	<i>Porcellio dilatatus</i>	SRR5253654
Crustacea: Malacostraca:Phyllocarida:Leptostraca	<i>Sarsinebalia urgorpii</i>	66993[BioProject]
Crustacea: Malacostraca:Phyllocarida:Leptostraca	<i>Speonebalia cannoni</i>	SRR4113509
Crustacea: Mystacocarida	<i>Derocheilocaris remanei</i>	SRR4113503
Crustacea: Oligostraca	<i>Argulus siamensis</i>	SRR514120
Crustacea: Oligostraca	<i>Cypridininae sp.</i>	PRJNA66997

Crustacea: Oligostraca	<i>Euphilomedes carcharodonta</i>	SRR2102714
Crustacea: Ostracoda	<i>Eusarsiella sp.</i>	SRR4113497
Crustacea: Ostracoda	<i>Paranesidea sp.</i>	SRR4113496
Crustacea: Ostracoda	<i>Vargula tsuji</i>	SRR1269674
Crustacea: Remipedia	<i>Godzilliognomus cf. frondosus</i>	SRR8280777
Crustacea: Remipedia	<i>Lasionectes entrichoma</i>	SRR4113498
Crustacea: Remipedia	<i>Pleomothra apletocheles</i>	SRR8280776
Crustacea: Remipedia	<i>Morlockia williamsi</i>	SRR8280778
Crustacea: Remipedia	<i>Xibalbanus tulumensis</i>	SRR4113501
Crustacea: Thecostraca	<i>Amphibalanus amphitrite</i>	SRR2034994
Crustacea: Thecostraca	<i>Chthamalus fragilis</i>	SRR4113502
Crustacea: Thecostraca	<i>Pollicipes pollicipes</i>	EST NCBI
Crustacea: Thecostraca	<i>Tetralita japonica</i>	SRR426837
Hexapoda: Archaeognatha	<i>Machilis hrabei</i>	GAUM00000000.2
Hexapoda: Archaeognatha	<i>Meinertellus cundinamarcensis</i>	GAUG00000000.2
Hexapoda: Collembola	<i>Anurida maritima</i>	GAUE00000000.2
Hexapoda: Collembola	<i>Folsomia candida</i>	GASX00000000.2
Hexapoda: Collembola	<i>Onychiurus Arcticus</i>	EST NCBI
Hexapoda: Collembola	<i>Pogonognathellus sp. AD-2013</i>	GATD00000000.2
Hexapoda: Diplura	<i>Campodea augens</i>	GAYN00000000.2
Hexapoda: Diplura	<i>Megajapyx sp.</i>	SRR400673
Hexapoda: Diplura	<i>Occasjapyx japonicus</i>	GAXJ00000000.2
Hexapoda: Protura	<i>Acerentomon sp.</i>	GAXE00000000.2
Hexapoda: Zygentoma	<i>Atelura formicaria</i>	GAYJ00000000.2
Hexapoda: Zygentoma	<i>Thermobia domestica</i>	GASN00000000.2
Hexapoda: Zygentoma	<i>Tricholepidion gertschi</i>	GASO00000000
Insect: Blattodea	<i>Blaberus atropos</i>	GAYD00000000.2
Insect: Blattodea	<i>Periplaneta americana</i>	GAWS00000000.2
Insect: Coleoptera	<i>Gyrinus marinus</i>	GAUY00000000.2
Insect: Coleoptera	<i>Lepicerus sp. AD-2013</i>	GAZB00000000.2
Insect: Coleoptera	<i>Tribolium castaneum</i>	PRJNA12540
Insect: Dermaptera	<i>Apachyus charteceus</i>	GAUW00000000.2
Insect: Dermaptera	<i>Forficula auricularia</i>	GAYQ00000000.2
Insect: Diptera	<i>Drosophila melanogaster</i>	PRJNA13812
Insect: Diptera	<i>Lipara lucens</i>	GAZD00000000.2
Insect: Diptera	<i>Trichocera saltator</i>	GAXZ00000000.2
Insect: Embioptera	<i>Aposthonia japonica</i>	GAWU00000000.2
Insect: Embioptera	<i>Haploembia palau</i>	GAZA00000000.2
Insect: Ephemeroptera	<i>Baetis sp.</i>	GATU00000000.2
Insect: Ephemeroptera	<i>Ephemera danica</i>	GAUK00000000.2
Insect: Grylloblattidae	<i>Grylloblatta bifratrilecta</i>	GAWP00000000.2
Insect: Hemiptera	<i>Cercopis vulnerata</i>	GAUN00000000.2
Insect: Hemiptera	<i>Nilaparvata lugens</i>	GAYF00000000.2
Insect: Hemiptera	<i>Notostira elongata</i>	GASV00000000.2
Insect: Hemiptera	<i>Rhodnius prolixus</i>	GECK00000000
Insect: Hymenoptera	<i>Chrysis viridula</i>	GATY00000000.2
Insect: Hymenoptera	<i>Fopius arisanus</i>	GBYB00000000.1
Insect: Hymenoptera	<i>Nasonia vitripennis</i>	GBEB00000000
Insect: Isoptera	<i>Mastotermes darwiniensis</i>	GAZE00000000.2

<b>Insect: Isoptera</b>	<i>Prorhinotermes simplex</i>	GASE00000000.2
<b>Insect: Lepidoptera</b>	<i>Nemophora degeerella</i>	GATC00000000.2
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<b>Insect: Mantodea</b>	<i>Empusa pennata</i>	GAWT00000000.2
<b>Insect: Mantodea</b>	<i>Mantis religiosa</i>	GASW00000000.2
<b>Insect: Mantophasmatodea</b>	<i>Tanzaniophasma sp. AD-2013</i>	GAXB00000000.
<b>Insect: Mecoptera</b>	<i>Boreus hyemalis</i>	GAYK00000000.2
<b>Insect: Neuroptera</b>	<i>Pseudomallada prasinus</i>	GAVV00000000.2
<b>Insect: Odonata</b>	<i>Calopteryx splendens</i>	GAYM00000000.2
<b>Insect: Odonata</b>	<i>Cordulegaster boltonii</i>	GAYO00000000.2
<b>Insect: Orthoptera</b>	<i>Gryllotalpa sp.</i>	GAWZ00000000.2
<b>Insect: Orthoptera</b>	<i>Gryllus firmus</i>	GAIZ00000000
<b>Insect: Orthoptera</b>	<i>Locusta migratoria</i>	SRR2037099
<b>Insect: Orthoptera</b>	<i>Tetrix subulata</i>	GASQ00000000.2
<b>Insect: Phasmatodea</b>	<i>Aretaon asperrimus</i>	GAWC00000000.1
<b>Insect: Phasmatodea</b>	<i>Peruphasma schultei</i>	GAWJ00000000.2
<b>Insect: Phthiraptera</b>	<i>Menopon gallinae</i>	GAWR00000000.2
<b>Insect: Plecoptera</b>	<i>Perla marginata</i>	GATV00000000.2
<b>Insect: Psocodea</b>	<i>Liposcelis bostrychophila</i>	GAYV00000000.2
<b>Insect: Psocoptera</b>	<i>Ectopsocus briggsi</i>	GAPT00000000.2
<b>Insect: Raphidioptera</b>	<i>Inocellia crassicornis</i>	GAZH00000000.2
<b>Insect: Raphidioptera</b>	<i>Xanthostigma xanthostigma</i>	GAUI00000000.2
<b>Insect: Siphonaptera</b>	<i>Ceratophyllus gallinae</i>	GAWK00000000.2
<b>Insect: Siphonaptera</b>	<i>Ctenocephalides felis</i>	GAYP00000000.2
<b>Insect: Strepsiptera</b>	<i>Stylops melittae</i>	GAZM00000000.2
<b>Insect: Thysanoptera</b>	<i>Gynaikothrips ficorum</i>	GAXG00000000.2
<b>Insect: Thysanoptera</b>	<i>Thrips palmi</i>	GAXC00000000.2
<b>Insect: Trichoptera</b>	<i>Hydroptila sp. AD-2013</i>	GAVM00000000.2
<b>Insect: Trichoptera</b>	<i>Platycentropus radiatus</i>	GASS00000000.2
<b>Insect: Zoraptera</b>	<i>Zorotypus caudelli</i>	GAYA00000000.2
<b>Insect: Neuroptera</b>	<i>Euroleon nostras</i>	GAXW00000000.2
<b>Outgroup: Chelicerata</b>	<i>Anoplodactylus eroticus</i>	Sharma et al. 2014
<b>Outgroup: Chelicerata</b>	<i>Dysdera crocota</i>	SRR1328258
<b>Outgroup: Chelicerata</b>	<i>Ixodes scapularis</i>	SRR1189647
<b>Outgroup: Chelicerata</b>	<i>Limulus polyphemus</i>	SRR1145732
<b>Outgroup: Chelicerata</b>	<i>Pycnogonum sp.</i>	SRR8745912
<b>Outgroup: Myriapoda</b>	<i>Glomeridesmus sp.</i>	SRR941771
<b>Outgroup: Myriapoda</b>	<i>Lithobius forficatus</i>	GBKE00000000
<b>Outgroup: Myriapoda</b>	<i>Polydesmus angustus</i>	GBKG00000000
<b>Outgroup: Myriapoda</b>	<i>Polyxenus lagurus</i>	GBKF00000000
<b>Outgroup: Myriapoda</b>	<i>Prostemmiulus sp.</i>	SRR945439
<b>Outgroup: Myriapoda</b>	<i>Scutigera coleoptrata</i>	SRR1158078
<b>Outgroup: Myriapoda</b>	<i>Strigamia maritima</i>	SRR1267275
<b>Outgroup: Onychophora (Peripatidae)</b>	<i>Epiperipatus sp.</i>	Roeding, F., et al. 2007
<b>Outgroup: Onychophora (Peripatopsidae)</b>	<i>Peripatoides novaezealandiae</i>	SRR8745911
<b>Outgroup: Onychophora (Peripatopsidae)</b>	<i>Peripatopsis overbergiensis</i>	SRX451023

In **black** species used initially during the OMA orthology-assignment